DOCUMENT RESUME

ED 161 601 RC 010 869

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|---|---|
| AUTHOR | Konan, Mildred; And Others |
| TITLE | Poverty and the Distribution of Mental Health Resources: Rural-Urban Comparisons. Scientific Article No. A2748, Contribution No. 5508 of the Maryland Agricultural Experiment Station. |
| SPONS AGENCY | Maryland Univ., College Park. Agricultural Experiment Station.; National Inst. of Mental Health (DHEW), Rockville, Md. |
| PUB DATE | [77] |
| CONTRACT | NIMH-278-75-0028 |
| NOTE | 34p.; Tables on pages 19 through 25 may not reproduce well due to poor print quality of original |
| EDRS PRICE | MF-$0.83 HC-$2.06 Plus Postage. |
| DESCRIPTORS | Community Health Services; Delivery Systems; Depressed Areas (Geographic); *Economic Disadvantagement; Facilities; Federal Aid; *Manpower Utilization; *Mental Health; *Mental Health Programs; *Rural Areas; *Rural Urban Differences; Urban Areas |
| IDENTIFIERS | Public Services |

ABSTRACT

In recognition of the greater needs of low socioeconomic status persons, federal grant policy has favored areas in which 25 percent or more of the population is impoverished. Areas of greater poverty have more resources both in terms of service structure and level of manpower, yet broad inequities are found when the rural-urban status of a mental health service area (catchment area) is considered. Regardless of the proportion of the population in poverty, metropolitan areas are more favorably endowed. Problems encountered in servicing rural areas are numerous. Sparsely settled areas cannot finance meaningful private sector mental health systems; low tax bases are insufficient to support public service systems. Provision of services is costly, and qualified manpower are not attracted to rural areas where professional interaction is low. Current programs should be examined to detect barriers to rural participation. More resources and local political organization may be needed to develop programs that will directly address the mental health needs of rural America. This study assesses mental health resources and examines facilities, services and manpower. Tabular data compares proportion of population in poverty with service structure, facility manpower hours, rural-urban status, and service modifications needed. (AUTHOR/DS)

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# Poverty and the Distribution of Mental Health Resources:

## Rural-Urban Comparisons

by

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Scientific Article No. A2748, Contribution No. 5508,
of the Maryland Agricultural Experiment Station.

RC 010869

# Poverty and the Distribution of Mental Health Resources: Rural-Urban Comparisons

Mildred Konan, Dan Tweed and James Longest*

ABSTRACT

Characteristics and levels of facility-based mental health resources are examined for catchment areas throughout the United States. Two structural measures of resources are used: (1) a typology of service structures, describing the extent to which four services (inpatient, outpatient, daycare, emergency) are available, accessible and above standard in quantity; and (2) a measure of levels of manpower in various relevant disciplines.

Catchment areas are grouped into three categories representing the proportion of the population in poverty. Analysis shows that areas of greater poverty have more resources, both in terms of service structure and level of manpower. Controlling for rural-urban status, however, reveals a sizable disparity between metropolitan and nonmetropolitan areas. Regardless of the proportion of the population in poverty, metropolitan areas are more favorably endowed. The reasons for such disparities and their policy implications are considered.

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# Poverty and the Distribution of Mental Health Resources: Rural-Urban Comparisons[1]

In implementing the Community Mental Health Centers (CMHC) program in 1973, policymakers and planners were concerned with the need to achieve equitable and comprehensive mental health services for citizens throughout the United States. The ultimate goal for the program was that at some point in the future each and every citizen of the United States, regardless of personal, economic or social circumstances, would have access to the full range of diagnostic and therapeutic services necessary for the maintenance or reinstatement of that citizen's well-being. In other words every citizen would have access to a "comprehensive" mental health service structure. The model for such a service structure was first provided by the concept of the "Community Mental Health Center" and first specified under Title II of Public Law 88-164. This law designated the range of services consistent with the goals of the program.

While the federal government is committed to universal accessibility to comprehensive service structures, it also recognizes the urgent needs of impoverished people. Research has consistently demonstrated that low socio-economic status is associated with mental disorder (Bloom, 1975). Generally this relationship holds within racial or ethnic populations, within specified residential areas and within administrative regions (Dohrenwend and Dohrenwend, 1969). Since people of low socio-economic status are also the least likely to be able to afford mental health services there is a particular challenge in attempting to provide mental health services in areas marked by high levels of poverty. To meet this challenge the federal government modified its grant stipulations

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[1]This research was supported by the Survey and Reports Branch, National Institute of Mental Health (Contract No. 278-75-0028) and the Maryland Agricultural Experiment Station (USDA Regional Research Project NE-89, Maryland T23). Appreciation is extended to Carle Taube, NIMH Project Officer, Harold Goldsmith, Ph.D., Richard Redick, Ph.D., and other NIMH personnel who assisted during the course of the study.

to favor areas in which 25 percent or more of the population is designated as impoverished.[2] This paper attempts: (1) to assess the consequences of such policies by comparing the characteristics and levels of facility-based[3] mental health resources in catchment areas having varying proportions of their population in poverty; and (2) to examine the differential distribution of resources in urban and rural areas having varying proportions of their populations in poverty.

Urban areas, and central city areas in particular, have traditionally played a key role in the distribution of goods and services--both to urban populations and to the populations of surrounding rural areas. In a great number of instances this has been a satisfactory relationship. In the area of health services, however, it means that in rural areas, the distance to service operates against the population in a very definitive way (Segal, 1973).

This study represents a structural assessment of mental health resources, as distinguished from process and outcome assessments (Donabedian 1966:166-206). It examines "the tools necessary to provide care--facilities, services and manpower" (Liptzin, 1974). It focuses on organizational aspects of health care systems which have an impact upon the availability of patient care and on the types and numbers of qualified experts available to deliver care. In contrast, process assessment examines the activities of care givers in the management of patients and outcome assessments investigate what happens to the patient following treatment. It is assumed that an adequate structure is a necessary but not sufficient condition for process or outcome adequacy.

The Unit of Analysis: Catchment Area

A key element in the CMHC program is the "catchment area" or mental health service area. Demographically, the ideal catchment area is a "geographical territory of a city, county or combination of counties which has a minimum of 75,000 and a maximum of 200,000 inhabitants." This "ideal" with respect to population size has not always been achieved. Functionally, the intent in the design of such areas is to provide a basis for the equitable distribution of mental health resources, i.e., to ensure the geographic availability of facilities, services and manpower. As of 1973, the United States and its population had been partitioned by the boundaries of 1499 catchment areas. These catchment areas are the units of analysis for this study.

Catchment areas in the U.S. have two major statuses: (a) those with federally funded community mental health centers (CMHC's); and (b) those without approved and federally funded centers. Of all 1499 catchment areas there were 385 with approved centers and 1114 without approved centers in 1973. The linkage between the catchment area concept and the role of the CMHC is defined as follows:

> "The catchment area is a cornerstone of the Community Mental Health Centers Program. Through implementation of this concept, a community mental health center assumes responsibility for making available the necessary services to meet the mental health needs of all the residents living within the defined geographical area. It is not necessary for a community mental health center to provide direct treatment at the center for every person within the catchment area. A center must, however, arrange for the provisions of service, either directly at the center

> or indirectly through systematic referral to other resources, both private and public, to every resident of the catchment area when requested. (National Institute of Mental Health, undated).

In other words, relative to the goals of the CMHC program a catchment area is "a full accountability mechanism for a designated population for which an institution must make available a specified range of services" (A.D. Little, Inc., 1973).

Data

Data for the analysis were derived from two sources. The National Institute of Mental Health National Reporting Program Inventory of Mental Health Facilities (NIMH/NRP) provided the most recent information available (in machine readable form) on the state of resource development in each of the 1499 catchment areas. The information is for the year 1973 and includes all catchment areas whether they have an approved Community Mental Health Center or have not as yet received approval for a CMHC. For each catchment area, the inventory provided an enumeration of the essential services, an indication of the type of facility in which those services were housed and the extent to which manpower and other resources were present to support the existing service complex. These data were used to develop a typology of service structures and a measure of the level of manpower.

Information pertaining to the sociodemographic characteristics of the population were obtained from the Mental Health Demographic Profile System (MHDPS) which is based on data from the 1970 U.S. Census. For each catchment area, MHDPS provided data concerning the proportion of the population in poverty and an indicator of rural-urban status.

## Variables

### Type of Service Structure

A typology of service structures was developed to place catchment areas into five categories ranging from those with four essential[4] services meeting certain specified criteria to catchment areas having none of the four essential services. The four essential services are inpatient, outpatient, partial hospitalization or daycare and emergency services. They are viewed as constituting a minimal range of diagnostic and therapeutic services necessary for the maintenance or reinstatement of a citizen's mental well-being.

The four concepts used to describe service structures in catchment areas and determine their allocation to one of the five categories are: availability, accessibility, comprehensiveness and adequacy. A particular service is defined as available in a catchment area if at least one facility offered that service to some portion of the catchment area population. In order to be defined as accessible, a service has to be (1) available and (2) offered by at least one facility which placed no categorical restriction upon the population eligible for the service.[5]

While availability and accessibility are concepts referring to characteristics of each of the four essential services, comprehensiveness refers to a service structure unit composed of the four essential services. A service structure in a catchment area is comprehensive if and only if: (1) all four essential services are available to some portion of the catchment area; and (2) all available services are accessible. Any catchment area which does not meet both of these requirements is said to be "less than comprehensive" or subcomprehensive. Thus a catchment area may be classified as having a sub-

comprehensive service structure if: (1) one or more of the essential services is not available; (2) at least one of the available services is inaccessible; or (3) both of the above are true.

It is generally recognized that in mental health services there is little or no consensus in the area of standards (Zusman and Ross, 1969; Bachrach, 1975; Longest et al., 1977:18-56). Consequently, standards of quantity used in the assessment of adequacy are intended only to provide comparative information and not any optimal or ideal resource level.

Standards of quantity for each of the essential services were developed in the following manner. First, appropriate variables were selected for assessing the adequacy of each essential service. Second, standards of adequacy were developed from the distributions of those catchment areas possessing an approved Community Mental Health Center (CMHC). Since CMHC's are not responsible for the "direct" provision of a service at a particular center, but may utilize referral systems to assure appropriate coverage, standards were computed on the basis of "total accessible quantities" in a catchment area, rather than those simply possessed by the CMHC itself. The adequacy variables chosen and the standards of adequacy are listed in Table 1 for each type of service.

[Table 1 about here]

The rationale for using the catchment areas with funded Community Mental Health Centers as a comparative standard for all catchment areas includes:

1. By virtue of its accorded responsibility the CMHC ought to be most responsive to the special requirements of the catchment area populations. Hence, we would expect the resource

levels in such areas to be reasonable adaptations to the problems of providing mental health services.

2. If there is some interdependence among services (and the concept of continuity of services implies that there is), then it is better to estimate the standard for a particular service in the context of a comprehensive service complex.

The minimum standards were derived from an analysis of the distributions for inpatient, outpatient and daycare services in the CMHC catchment areas; the lowest quintile is used as the cutting point for minimum standards in this analysis. A catchment area's emergency services were designated as substandard if there was not at least one facility offering an accessible walk-in emergency service, 24 hours a day, seven days a week. The standards thus derived and used to assess adequacy are presented in Table 1.

These considerations resulted in the following operational definitions with respect to adequacy.

An individual service will be considered inadequate in a catchment area if it is:

1. Deficient in availability--not available in that catchment area (i.e., there is no facility in the catchment area which offers the service under consideration to some portion of the catchment area population);
2. Deficient in accessibility--available but inaccessible (i.e., every facility offering the service is of the limited community or restrictive type);
3. Deficient in quantity--available and accessible, but present in quantity judged below standard relative to the adopted standard used to assess adequacy (See Table 1).

Using the four concepts of availability, accessibility, comprehensiveness and adequacy described above, five types of service structures were specified.

1. The service structure is comprehensive and has all services above standard in quantity (Comprehensive; All Services Above Standard);
2. The service structure is comprehensive but has one to four services designated as substandard in quantity (Comprehensive; At Least One Service Substandard);
3. The service structure is subcomprehensive but has four services available (Subcomprehensive; but Complete);[6]
4. The service structure is subcomprehensive and has one to three services available (Subcomprehensive and Incomplete);
5. The service structure is empty; no services are available (Subcomprehensive; No Services Available).

Levels of Manpower

To describe the manpower resources which energize service structures, a variable reflecting the level of manpower in facilities was developed. This variable provides data on manpower hours per 100,000 population for total facility staff and for the following disciplines: psychiatrists, physicians, psychologists (M.A. and above), social workers (M.A. and above), registered nurses, other professsionals (B.A. and above) and paraprofessionals.

It should be noted that this variable is based on data generated by the NIMH National Reporting System and represents only manpower within facilities. Consequently persons employed outside mental health facilities (for example, school psychiatrists, private practice

psychiatrists and other mental health manpower) are not represented in this variable.

Population in Poverty

To examine the effects of population in poverty on the types of service structures, catchment areas are grouped into three categories.

1. Catchment areas with less than 10 pereent of the population in poverty;
2. Catchment areas with 10 percent to 25 percent of the population in poverty; and
3. Catchment areas with 25 percent or more of the population in poverty.

Poverty level is determined by the poverty index of the Social Security Administration (U.S. Bureau of the Census, 1972). Each of the catchment areas which falls into the third category qualifies as a poverty area under federal guidelines, and as such, qualifies for special consideration in federal grants.

Rural-Urban Status

The degree of rural-urban status of each catchment area is measured by a classification system devised by NIMH and incorporated in the Mental Health Demographic Profile System. The classification is derived from the fact that each county of the United States can be classified as to whether or not it is part of a Standard Metropolitan Statistical Area (SMSA). Each catchment area is composed of a portion of one or more counties. A catchment area is said to be metropolitan if every one of its counties or portions thereof is in an SMSA area.

A catchment area which has no component in an SMSA county is said to be nonmetropolitan. A catchment area which has components in both

SMSA and non-SMSA counties, on the other hand, is designated as a mixed catchment area due to the fact that it has both SMSA and non-SMSA components.

## Analysis

### Population in Poverty and Type of Service Structure

Given that the CMHC program has modified its grant stipulations in order to make more funds available to poverty areas, it would be expected that such areas would have a higher probability of having an adequate collection of mental health services. Table 2 indicates that this is, in fact, the case. Among catchment areas with 24 percent or more of the population in poverty, 26 percent have comprehensive service structures with all services above standard in quantity. For catchment areas with lower levels of poverty the comparable figures are 20 percent (when 10-25 percent of the population is in poverty) and 9 percent (when less than 10 percent of the population is in poverty). High poverty areas are somewhat less likely to be subcomprehensive with all services available but one or more services inaccessible (7 percent compared to 16 and 22 percent respectively). Nevertheless it is apparent from Table 1 that large numbers of catchment areas at each poverty level are subcomprehensive with one or more of the essential services unavailable.

[Table 2 about here]

Table 3 clarifies the data presented in Table 2 by organizing it in terms of the percent of catchment areas with service structures requiring structural modification. The data show that, as of 1973, 73.6 percent of the high poverty areas were coping with deficient service structures, including 52.3 percent with service structures requiring major structural modification. In contrast, 90.6 percent of low poverty

areas had deficient service structures, including 59.3 percent requiring major structural modification. It is clear from Table 3 that the likelihood of having a deficient service structure decreases as the level of population in poverty increases.

[Table 3 about here]

Poverty and Level of Manpower

Table 4 presents data relevant to the question: "Are differences in the proportion of the population in poverty associated with differences in levels of facility manpower available?" The findings suggest that this is, in fact, the case.

[Table 4 about here]

Compared with areas having lower proportions of their population in poverty, areas with 25 percent or more of their population in poverty show higher mean numbers of hours per 100,000 population for psychiatrists, physicians, psychologists, other professionals and for paraprofessionals. Mean values for social workers were almost identical in the three poverty categories. Only registered nurses show the reverse pattern with low poverty areas having the highest mean number of registered nurse hours per 100,000 population.

Rural-Urban Comparisons

The preceding analysis has shown that high poverty catchment areas are less likely to be structurally deficient and less likely to have relatively low levels of facility manpower. To what extent do these relationships hold when controls are introduced?

Tables 5 and 6 indicate that rural-urban status is an important variable to use as a control in the relationship between levels of poverty and adequacy of mental health resources. Those catchment areas

with 25 percent or more of the population in poverty have quite different levels of structural development in metropolitan as opposed to nonmetropolitan areas. In metropolitan catchment areas with 25 percent or more of the population in poverty, 49.0 percent have adequate service structures (Table 6). Similarly, only 28.5 percent of the metropolitan poverty areas compared to 62.5 percent of the nonmetropolitan areas require major structural modification (Table 6). In 11.7 percent of the impoverished nonmetropolitan catchment areas as compared to 4.2 percent in metropolitan areas there were no services available at all.

[Tables 5 and 6 about here]

For manpower characteristics a similar pattern emerges. The greater quantity of manpower in areas with 25 percent or more of their population in poverty, is primarily concentrated in metropolitan poverty areas (Table 7). At this level of poverty, every discipline has lower mean numbers of hours in nonmetropolitan than in mixed or metropolitan areas. In most of the manpower categories the differences are pronounced. For example, metropolitan areas with 25 percent or more of their population in poverty have a mean of 1016 psychiatrist hours per 100,000 population, compared to a mean value of 79 for nonmetropolitan areas. Similarly, metropolitan areas have a mean of 807 social worker hours per 100,000 population compared to a mean of 111 for nonmetropolitan areas.

[Table 7 about here]

A similar although less pronounced pattern is observed by comparing metropolitan and nonmetropolitan categories in areas with lower levels of poverty. However, while metropolitan areas with high poverty have more manpower in all disciplines than do metropolitan

areas with less than 25 percent of their population in poverty, the nonmetropolitan areas with high poverty have less manpower in all disciplines than do nonmetropolitan areas with less than 25 percent of their population in poverty. The findings suggest that rural areas of high poverty are in a very unfavorable manpower position. In addition, as noted earlier, nonmetropolitan areas of high poverty are less likely than metropolitan areas to have structurally adequate mental health service structures and their structural deficiencies are more likely to require major modifications.

Why do these rural-urban differences in services exist? Presumably all three of the rural-urban categories with 25 percent or more of their populations in poverty have the same access to federal grants. Or do they? It appears that at least three factors are operating against nonmetropolitan poverty areas.

First, the basic ecological organization of the society itself appears to put nonmetropolitan areas at a disadvantage. Earlier research on community services indicates metropolitan areas generally have a greater depth of human services--including mental health services. These services in urban poverty areas have served as an efficient springboard for the development of the CMHC program. Where a good resource base already exists the goals of the CMHC program can be implemented with a relative modicum of cost and effort. In impoverished nonmetropolitan areas, however, the resource situation has not been so favorable. Too often the provision of comprehensive mental health services in such an area is a costly and major endeavor. Greater costs are amplified by the necessity of providing services to a sparsely settled population.

Second, the lack of effective means of political organization and governmental resources (as is provided in municipal governments in larger urban areas) is likely to make it more difficult for rural areas to take advantage of federal programs.

Finally, inability of many nonmetropolitan areas to attract and sustain an adequate resource base puts them at a disadvantage. For example, rural areas are generally less able to attract and keep well qualified manpower than are urban areas (Segal, 1973:52-54). These three factors appear to be operative in suppressing the percentage of adequate service structures in rural poverty areas.

## Summary and Conclusions

The Community Mental Health Centers program was designed in 1963 with the goal of achieving equitable and comprehensive mental health services for citizens throughout the United States. In recognition of the greater needs of low socioeconomic status persons, federal grant policy has favored areas in which 25 percent or more of the population is designated as impoverished. The preceding analysis presents a structural assessment of the results of this policy. High poverty areas are more likely than low poverty areas to have adequate collections of mental health services. As the level of population in poverty increases, the likelihood of having a deficient service structure decreases. High poverty areas also have relatively higher levels of facility manpower.

Broad inequities are found, however, when the rural-urban status of the catchment area as well as level of poverty is considered. Regardless of the proportion of the population in poverty, metropolitan areas tend to have more adequate service structures and a

more abundant supply of the necessary mental health manpower. Non-metropolitan areas of high poverty are in a less favorable resource situation--particularly on the availability of mental health manpower.

These discrepancies between urban and rural poverty areas in terms of both manpower and service structure present a challenge to mental health planners at all levels of government. The problems encountered in servicing rural areas are numerous. Sparsely settled areas cannot finance meaningful private sector mental health systems and have low tax bases upon which to support public service systems. Also, the provision of services in sparsely settled areas is costly and qualified manpower is not attracted to rural areas where professional interaction tends to be low. The situation is even worse when the rural areas are characterized by high levels of poverty.

There is a need, therefore, to examine current programs (particularly those aimed at poverty areas) to detect whatever barriers there may be to rural participation. Do the programs demand more resources than rural poverty areas are able to supply? Do they require more local political organization than rural poverty areas are likely to be able to muster? Is there a need for new programs to directly address the mental health needs of rural America? The answer to each of these questions is likely to be yes.

Footnotes

[2]Poverty level is determined by the poverty index of the Social Security Administration (U.S. Bureau of the Census, 1972:29-31).

[3]Being concerned with only those resources located in mental health facilities, this report excludes an analysis of another vital resource, psychiatric manpower in private practice.

[4]Under the terms of initial CMHC legislation, five services were designated as "essential" because their presence was a prerequisite for any CMHC receiving funds. Data for consultation and education services, the fifth service identified as essential, were excluded from this assessment because pertinent data were unavailable for facilities not qualifying as federally-funded CMHC's.

[5]Mental health facilities are found in several different types of facilities throughout the United States. Some operate under age or diagnostic restrictions on eligibility for service. Others such as proprietary mental hospitals and nonpublic residential treatment centers are considered restrictive because their cost precludes their use by a significant portion of the general public. In addition, Veterans Administration facilities are defined as restrictive because they serve only veterans. State mental hospitals present a peculiar problem because they are typically "accessible" to several catchment areas, not just to the catchment area in which they physically exist. Since no accurate way could be found to ascertain which catchment areas are served by which state hospitals or to proportionally allocate resources among the relevant catchment areas, state mental hospital resources (specifically inpatient services in state mental health hospitals) were treated as if they were inaccessible even though in actuality they are accessible. They are, thus, represented only in terms of "availability" in the typology of service structure.

[6]To simplify description, the term complete is used to describe a service structure which has each of the four essential services (Inpatient, Outpatient, Daycare, Emergency) available in the catchment area. A service structure is comprehensive if it is complete and each of the services is accessible (i.e. has no categorical restrictions on the populations eligible for the service).

Table 1. Summary of adequacy assessment variables and adequacy standards used to assess the adequacy of the four essential services.

| Type of service | Adequacy assessment variables | The adequacy standards |
|---|---|---|
| Inpatient service | Accessible Inpatient Beds per 1000 Population | .14 or more* |
| Outpatient service | Accessible Outpatient Staff Treatment Hours per 1000 Population | 3.01 or more* |
| Daycare service | Accessible Daycare Hours per 1000 Population | 1.41 or more* |
| Emergency service | Temporal availability of Accessible Emergency Services | At least one facility offering accessible walk-in emergency service, 24 hours a day, seven days a week |

*The lowest quintile for catchment areas possessing a CMHC is designated as substandard.

Table 2. Distribution of catchment areas by type of service structure and level of poverty.

| Level of poverty | Type of service structure: Comprehensive:* all services above standard | Comprehensive: at least one service substandard | Subcomprehensive: but complete** | Subcomprehensive and incomplete | Subcomprehensive no services available | Total |
|---|---|---|---|---|---|---|
| Less than 10% of population in poverty | 9.4% (55) | 9.1% (53) | 22.2% (130) | 50.8% (297) | 8.5% (50) | 100.0% (N=585) |
| 10% to 25% of population in poverty | 20.4% (147) | 13.9% (100) | 16.0% (115) | 43.4% (313) | 6.4% (46) | 100.0% (N=721) |
| 25% and above in poverty | 26.4% (51) | 14.0% (27) | 7.3% (14) | 43.0% (83) | 9.3% (18) | 100.0% (N=193) |
| All catchment areas | 16.9% (253) | 12.0% (180) | 17.3% (259) | 46.2% (693) | 7.6% (114) | 100.0% (N=1499) |

*A service structure is comprehensive if and only if that service structure has each of the four essential services (Inpatient, Outpatient, Daycare and Emergency) available in the catchment area and fully accessible (i.e. without categorical restrictions upon the populations eligible for service).

**A service structure is complete if and only if each of the four essential services (Inpatient, Outpatient, Daycare and Emergency) is available in the catchment area.

Table 3. Distribution of catchment areas with a service structure requiring structural modification by levels of poverty

| Level of poverty | Percent of catchment areas having adequate service structures | Percent of catchment areas with service structures requiring some structural modification* | minor structural modification** | major structural modification*** | Number of catchment areas at each poverty level |
|---|---|---|---|---|---|
| Less than 10% of population in poverty | 9.4% (55) | 90.6% (530) | 31.3% (183) | 59.3% (347) | 585 |
| 10% to 25% of population in poverty | 20.4% (147) | 79.6% (574) | 29.8% (215) | 49.8% (359) | 721 |
| 25% and above in poverty | 26.4% (51) | 73.6% (142) | 21.5% (41) | 52.3% (101) | 193 |

*A service structure requires structural modification if one or more of its services are deficient in resource quantities, deficient in accessibility, or deficient in availability.

**A service structure requires minor structural mofification if the necessary modifications are limited to (1) eliminating deficiencies of quantity and/or (2) eliminating deficiencies of accessibility. All such service structures are at least complete (have all four essential services available).

***A service structure requires major structural modification if there are any of the essential services absent in the catchment area. Such a service structure may also suffer from any or all other forms of deficiencies in remaining services.

Table 4. Differences in facility manpower hours per 100,000 population for selected disciplines by level of poverty of catchment area.

| Level of poverty | | Facility manpower hours per 100,000 population for selected disciplines: Psychiatrists | Physicians | Psychologists MA & above | social workers MA & above | Registered Nurses | Professionals BA & above | Para-Professionals | Total Facility Staff | N |
|---|---|---|---|---|---|---|---|---|---|---|
| Less than 10% of population in poverty | x | 282.9 | 71.8 | 197.8 | 308.8 | 737.9 | 419.5 | 2965.8 | 4968.8 | 585 |
| | S.D. | 645.5 | 189.4 | 307.9 | 430.5 | 1242.7 | 672.3 | 6745.2 | 9164.3 | |
| 10 to 25% of population in poverty | x | 254.7 | 63.7 | 210.2 | 295.6 | 614.7 | 456.1 | 2616.0 | 4513.4 | 721 |
| | S.D. | 502.5 | 157.0 | 251.9 | 368.2 | 963.1 | 634.8 | 5351.7 | 7277.3 | 721 |
| 25% or more of population in poverty | x | 321.1 | 75.7 | 228.1 | 299.3 | 544.3 | 519.2 | 3385.5 | 5375.7 | 193 |
| | S.D. | 843.5 | 242.8 | 388.8 | 573.8 | 1129.0 | 839.4 | 10249.8 | 12477.0 | |

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Table 5. Distribution of catchment areas by type of service structure, level of poverty and rural-urban status.

| Level of poverty | Rural-urban status | Type of service structure: Comprehensive:* all services above standard | Comprehensive: at least one service substandard | Subcomprehensive but complete** | Subcomprehensive and incomplete | Subcomprehensive no services available | Total |
|---|---|---|---|---|---|---|---|
| Less than 10% of population in poverty | Nonmetropolitan | 7.4% (4) | 14.8% (8) | 18.5% (10) | 59.3% (32) | 0.0% (0) | 100.0% (54) |
| | Mixed | 4.6% (3) | 15.4% (10) | 23.1% (15) | 52.3% (34) | 4.6% (3) | 100.0% (65) |
| | Metropolitan | 10.3% (48) | 7.5% (35) | 22.5% (105) | 49.6% (231) | 10.1% (47) | 100.0% (465) |
| 10 to 25% of population in poverty | Nonmetropolitan | 16.8% (52) | 14.8% (46) | 11.6% (36) | 49.7% (154) | 7.1% (22) | 100.0% (310) |
| | Mixed | 21.7% (28) | 18.6% (24) | 14.0% (18) | 44.2% (57) | 1.6% (2) | 100.0% (129) |
| | Metropolitan | 23.8% (57) | 10.6% (30) | 21.6% (61) | 36.2% (102) | 7.8% (22) | 100.0% (282) |
| 25% or more of population in poverty | Nonmetropolitan | 17.5% (21) | 18.3% (22) | 1.7% (2) | 50.8% (61) | 11.7% (14) | 100.0% (120) |
| | Mixed | 25.0% (6) | 12.5% (3) | 12.5% (3) | 45.8% (11) | 4.2% (1) | 100.0% (24) |
| | Metropolitan | 49.0% (24) | 4.1% (2) | 16.4% (9) | 22.4% (11) | 6.1% (3) | 100.0% (49) |
| All catchment areas | | 16.9% (253) | 12.0% (180) | 17.3% (259) | 46.2% (693) | 7.6% (114) | 100.0% (1499) |

*A service structure is comprehensive if and only if that service structure has each of the four essential services (Inpatient, Outpatient, Daycare and Emergency) available in the catchment area and fully accessible (i.e. without categorical restrictions upon the population eligible for service.

**A service structure in a catchment area is complete if and only if each of the four essential services (Inpatient, Outpatient, Daycare and Emergency) is available in the catchment area.

Table 6. Distribution of catchment areas with a service structure requiring structural modification by levels of poverty and rural-urban status.

| Level of poverty | Rural-urban status | Percent of catchment areas having adequate service structures | Percent of catchment areas with service structures requiring some structural modification* | minor structural modification** | major structural modification*** | Number of catchment areas at each poverty level |
|---|---|---|---|---|---|---|
| Less than 10% of population in poverty | Nonmetropolitan | 7.4% (4) | 92.6% (50) | 33.8% (18) | 59.3% (32) | 54 |
| | Mixed | 4.6% (3) | 95.4% (62) | 38.5% (25) | 56.9% (37) | 65 |
| | Metropolitan | 10.3% (48) | 89.7 (418) | 30.0% (140) | 59.7% (278) | 466 |
| 10 to 25% of population in poverty | Nonmetropolitan | 16.8% (52) | 83.2% (258) | 26.4% (82) | 56.8% (176) | 310 |
| | Mixed | 21.7% (28) | 78.3% (101) | 32.6% (42) | 45.8% (59) | 129 |
| | Metropolitan | 23.8% (67) | 76.2% (215) | 32.2% (91) | 44.0% (124) | 282 |
| 25% or more of population in poverty | Nonmetropolitan | 17.5% (21) | 82.5% (99) | 20.6% (24) | 62.5% (75) | 120 |
| | Mixed | 25.0% (6) | 75.0% (19) | 25.0% (6) | 50.0% (12) | 24 |
| | Metropolitan | 49.0% (24) | 51.0% (25) | 22.5% (11) | 28.5% (14) | 49 |

*A service structure requires structural modification if one or more of its services are deficient in resource quantities, deficient in accessibility, or deficient in availability.

**A service structure requires minor structural modification if the necessary modifications are limited to (1) eliminating deficiencies of quantity and/or (2) eliminating deficiencies of accessibility. All such service structures are at least complete (have all four essential services available).

***A service structure requires major structural modification if there are any of the essential services absent in the catchment area. Such a service structure may also suffer from any or all other forms of deficiencies in remaining services.

Table 7. Differences in facility manpower hours per 100,000 population for selected disciplines by level of poverty and rural-urban status of catchment areas.

| Level of poverty | | | Facility manpower hours per 100,000 population for selected disciplines | | | | | | | | N |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Psychiatrists | Physicians | Psychologists MA & above | Social workers MA & above | Registered nurses | Other professionals BA & above | Para-professionals | Total facility staff | |
| Less than 10% of population in poverty | Nonmetropolitan | $\bar{x}$ | 207.7 | 86.9 | 215.3 | 273.0 | 910.5 | 405.1 | 4023.6 | 6124.7 | 54 |
| | | S.D. | 379.7 | 164.3 | 240.8 | 247.0 | 1627.3 | 576.8 | 7715.9 | 10357.4 | |
| | Mixed | $\bar{x}$ | 126.0 | 48.4 | 160.0 | 227.4 | 586.2 | 362.3 | 2570.9 | 4083.8 | 65 |
| | | S.D. | 238.6 | 128.5 | 176.1 | 212.7 | 1008.6 | 511.5 | 5653.5 | 7605.0 | |
| | Metropolitan | $\bar{x}$ | 313.4 | 73.3 | 201.0 | 324.2 | 739.1 | 429.1 | 2898.3 | 4981.0 | 466 |
| | | S.D. | 702.8 | 98.9 | 328.5 | 467.1 | 1221.1 | 702.2 | 6767.6 | 9220.9 | |
| 10 to 25% of population in poverty | Nonmetropolitan | $\bar{x}$ | 138.4 | 56.2 | 178.9 | 224.9 | 467.1 | 391.0 | 2406.3 | 3865.1 | 310 |
| | | S.D. | 285.0 | 158.4 | 183.1 | 236.6 | 874.8 | 681.1 | 5664.0 | 7429.2 | |
| | Mixed | $\bar{x}$ | 199.7 | 90.6 | 199.1 | 242.6 | 705.3 | 449.6 | 3728.2 | 5617.8 | 129 |
| | | S.D. | 290.0 | 176.1 | 193.0 | 236.1 | 1013.7 | 525.8 | 6462.4 | 8379.8 | |
| | Metropolitan | $\bar{x}$ | 407.6 | 59.7 | 249.6 | 397.5 | 735.4 | 530.8 | 2337.7 | 4720.9 | 282 |
| | | S.D. | 692.5 | 145.1 | 325.7 | 493.2 | 1012.1 | 621.5 | 4288.4 | 6476.7 | |
| 25% or more of population in poverty | Nonmetropolitan | $\bar{x}$ | 79.5 | 58.6 | 125.1 | 111.4 | 282.4 | 372.8 | 2759.0 | 3791.1 | 120 |
| | | S.D. | 214.3 | 274.7 | 182.4 | 160.9 | 652.1 | 619.1 | 10939.7 | 12628.7 | |
| | Mixed | $\bar{x}$ | 109.0 | 115.0 | 199.2 | 201.3 | 419.6 | 510.5 | 6945.8 | 8503.3 | 24 |
| | | S.D. | 159.4 | 210.6 | 265.1 | 257.7 | 569.5 | 1064.9 | 13490.2 | 14295.5 | |
| | Metropolitan | $\bar{x}$ | 1016.0 | 98.3 | 494.5 | 807.4 | 1247.0 | 882.0 | 3176.0 | 7724.3 | 49 |
| | | S.D. | 1434.5 | 159.9 | 623.7 | 929.6 | 1790.4 | 1066.1 | 5382.4 | 9920.4 | |

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